

DEER HERD UNIT MANAGEMENT PLAN
Deer Herd Unit #25
(Plateau, Fishlake #25A
Plateau, Thousand Lakes #25B
Plateau, Boulder #25C/Kaiparowits #26)
April 2015

BOUNDARY DESCRIPTION

Sevier, Garfield, Piute, Kane and Wayne counties - Boundary begins at SR-24 and US-89 at Sigurd; south on SR-24 to SR-62; south on SR-62 to SR-22; south on SR-22 to the Widtsoe-Antimony road; south on the Widtsoe-Antimony road to SR-12; east on SR-12 to the Paria River; south on the Paria River to the Utah-Arizona state line; east along the state line to Lake Powell; along the shore of Lake Powell to the Burr trail road; north on the Burr Trail to the Notom Road; north on the Notom Road to SR-24; east on SR-24 to the Caineville Wash road; north on the Caineville Wash road to I-70; west on I-70 to US-89; south on US-89 to SR-24.

UNIT MANAGEMENT GOALS

- Manage for a population of healthy animals capable of providing a broad range of recreational opportunities, including hunting and viewing.
- Balance deer herd impacts on human needs, such as private property rights, agricultural crops and local economies.
- Maintain the population at a level that is within the long-term capability of the available habitat to support.

POPULATION MANAGEMENT OBJECTIVES

- < Target Winter Herd Size - Achieve a target population size of 25,000 wintering deer (modeled number) during the five-year planning period unless range conditions become unsuitable, as evaluated by DWR. Range Trend data coupled with annual browse monitoring will be used to assess habitat condition. If habitat damage by deer is occurring due to inadequate habitat, measures will be taken to reduce the population to sustainable levels.
- < Sub-unit #25A - 10,000
- < Sub-unit #25B - 3,000
- < Sub-unit #25C -12,000
- < Sub-unit #26 – 1,000
- Herd Composition – All units within this plan are General Season units and will be managed to maintain a three year average postseason buck to doe ratio of 18-20 according to the statewide plan. Plateau, Boulder/Kaiparowits (25C/26) was previously managed to maintain a three year average postseason buck to doe ratio of 15-17.

Plateau, Thousand Lakes (25B) was changed to a General Season unit in 2012. At some point in the future this unit may need to be joined to the Plateau, Fishlake deer unit. The Plateau, Thousand Lakes unit is very small geographically and it has a transient deer population. In order to facilitate deer and hunter management this change may need to be made at some point.
- Harvest – General Buck Deer hunt regulations, using archery, rifle, and muzzleloader hunts. Antlerless removal will be implemented to achieve the target population size using a variety of harvest methods and seasons. It is recognized that buck harvest may fluctuate due to climatic and productivity variables. Buck harvest strategies will be developed through the RAC and

Wildlife Board process to achieve management objectives. Due to a history of crowding or concern about increasing permits, we will explore the possibility of altering the percentage of permits allocated to the different weapon types as described in the statewide management plan.

	Objective from past plan (2010)	Long-term Objective	2006-2014 Objective	Change
Plateau, Fishlake # 25A	10,000	10,000	10,000	0
Plateau, Fishlake Thousand Lakes #25B	3,000	3,000	3,000	0
Plateau, Boulder #25C/Kaiparowits #26	12,000	12,000	12,000	0
UNIT TOTAL	25,000	25,000	25,000	0

POPULATION MANAGEMENT STRATEGIES

Monitoring

- Population Size - Utilizing harvest data, postseason and mortality estimates, a computer model has been developed to estimate winter population size. The 2014 model estimates the population at 17,400 deer.
- Buck Age Structure - Monitor age class structure of the buck population through the use of checking stations, postseason classification, statewide harvest survey data and bag checks.
- Harvest - The primary means of monitoring harvest will be through the statewide harvest survey and the use of checking stations.

Limiting Factors (May prevent achieving management objectives)

- Crop Depredation - The Division of Wildlife Resources will maintain aggressive programs to eliminate or lessen the burden of deer depredation on private cultivated and stored agricultural crops. Crop depredation problems will be addressed as provided for in applicable laws, rules and policies, and procedures of Utah's Landowner Assistance Program for big game. When necessary, control hunts will be implemented through the RAC process. When a problem needs immediate attention, local biologists may call depredation hunts and issue mitigation permits to keep deer away from cultivated and stored agricultural crops. These control hunts will be specified in areas where only offending animals will be harvested. Applicable laws, policies, and procedures will also be followed to lessen the burden of big game on private rangelands.
- Habitat - The amount and condition of summer habitat on public lands, landowner acceptance and winter forage conditions will determine herd size. Excessive habitat utilization will be addressed through antlerless removal.

- Predation - Follow DWR predator management policy:
 - If the population estimate is less than 90% of objective and fawn to doe ratio drops below 70 for 2 of the last 3 years, or if the fawn survival rate drops below 50% for one year, then a Predator Management Plan targeting coyotes may be implemented.
 - If the population estimate is less than 90% of objective and the doe survival rate drops below 85% for 2 of the last 3 years or below 80% for one year, then a Predator Management Plan targeting cougar may be implemented.
- Highway Mortality – DWR will Cooperate with the Utah Dept. Of Transportation to construct highway fences, passage structures and warning signs etc if needed. Currently, highway mortality is not a limiting factor on this unit.
- Illegal Harvest - If illegal harvest is identified as a limiting factor, a unit specific action plan will be develop in cooperation with the Law Enforcement Section.

PLATEAU UNIT HABITAT MANAGEMENT OBJECTIVES

Deer Herd Unit # 25A (Plateau Fishlake)

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Encourage vegetation manipulation projects and seeding to increase the availability, abundance and nutritional content of browse, grass, and forb species.
- Seek cooperative projects and programs to encourage and improve the quality and quantity of deer habitat, with public and private land managers to maintain a stable or upward trend in vegetative composition.
- Provide improved habitat security and escapement opportunities for mule deer keeping habitat restoration projects a priority for wildlife.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection, Improvement and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.
- Continue to cooperate with Utah Department of Transportation (UDOT) and or Sportsman's groups to identify areas to mitigate and prevent deer-vehicle collisions to the extent possible.
- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips.
- Reseed mechanical treatment areas with selected seed species that will out compete areas dominated by Cheatgrass with desirable perennial vegetation focusing on seeding native grass species.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog and chaining projects.
- Cooperate with federal land management agencies and local governments in developing and administering access management plans for the purposes of habitat protection and escape or security areas.
- Future habitat work should be concentrated on the following management priorities:
 - Increase browse species in critical winter range, and burned areas.
 - Improve the need for future carrying capacity of mule deer within the unit.
 - Increase critical winter range opportunities for mule deer.
 - Maintain summer fawning areas by increasing beneficial habitat work in summer and transitional habitat areas.
 - Continue to monitor and collect data from browse transects and permanent range trend studies located throughout the seasonal ranges within the unit.
 - Continue to reduce threats to catastrophic wildfires, by reducing fuel loads and creating firebreaks.
 - When selecting and implementing habitat restoration projects, design and develop with wildlife benefit, including grass, forbs and shrubs for mule deer within the seed mixes.
 - Support enhancement and restoration efforts in Quaking Aspen forests unit wide by reducing encroachment of Spruce-Fir forests.
 - Continue to use the Watershed Restoration Initiative (WRI) to identify, implement, and fund critical habitat projects throughout the unit, while partnering with federal, state, and private landowners to achieve these goals.

Completed Habitat Projects	# Projects Completed	Acres
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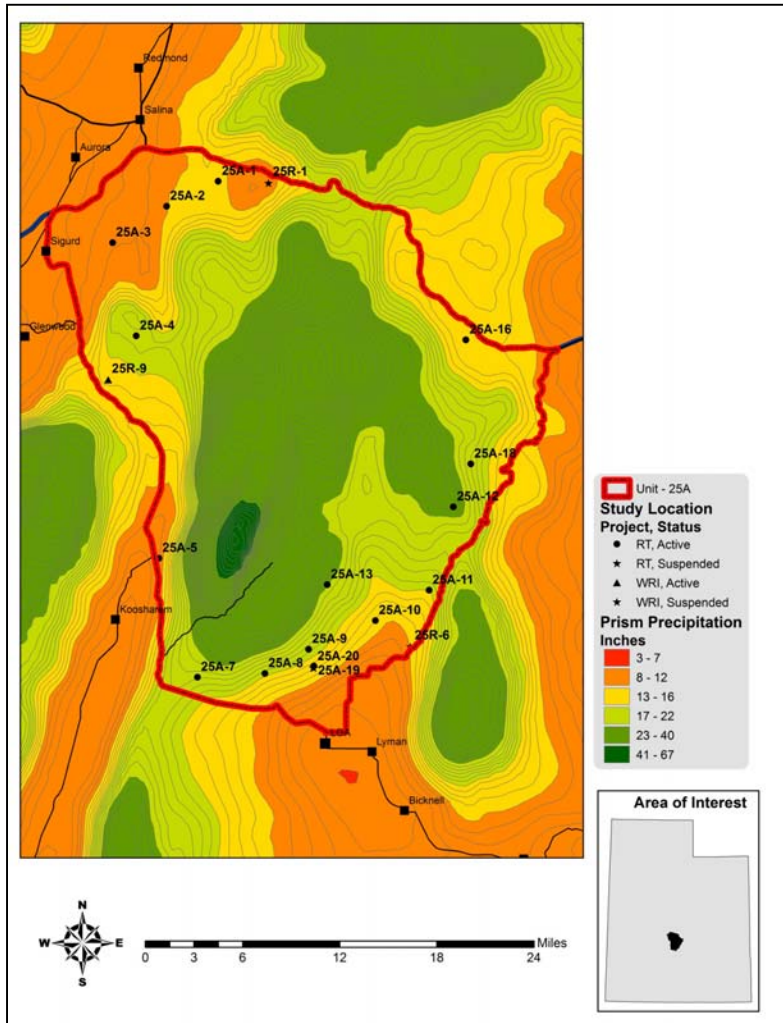
2006-2014		
Dixie Harrow, Seed	3	7,110
Anchor Chain, Seed	3	2,319
PJ Removal, Seed	2	5,246
PJ Removal, L/S	1	2,275
TOTAL	9	16,950

- Spreadsheet only accounts for completed projects within the WRI Database, current projects are being implemented, along with recommended proposals for future restoration projects within the unit.

Community Types

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 8 inches on the south and northwest of the unit to 41 inches on the high elevation peak of the Fish Lake Hightop Plateau. All of the Range Trend and WRI monitoring studies on the unit occur within 11-23 inches of precipitation.

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4). The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2013. The mean annual PDSI displayed years of moderate to extreme wet years from 1982-1985, 1997-1998, 2005, and 2011. The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2002-2004, and 2013; and displayed years of moderate to extreme wet years in 1982-1985, 1993, 1995, 1999, 2001, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009 and 2012; and displayed years of moderate to extreme wet years in 1982-1985, 1997-1998, 2008 and 2011.



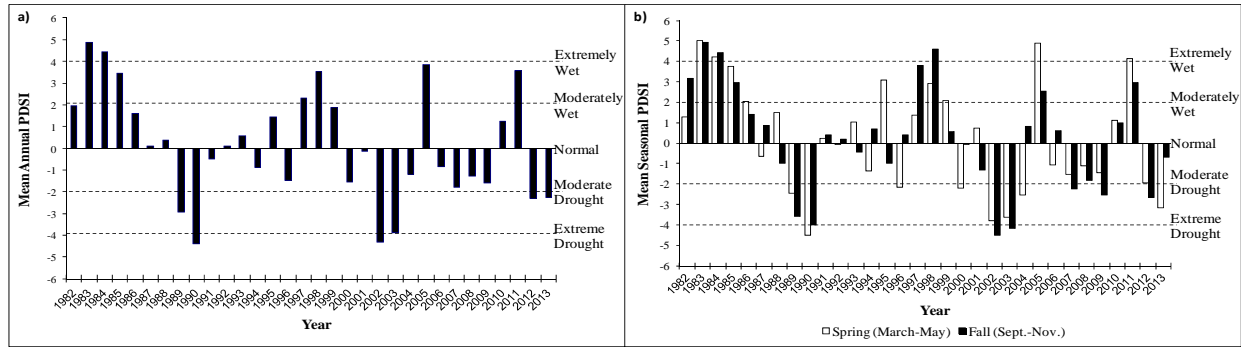


Figure.1: The 1982-2014 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2013. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought (Time Series Data 2014). a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2014).

Big Game Habitat

Total mule deer range in the wildlife management unit is estimated at 430,833 acres with 241,169 classified as summer range and 189,664 acres classified as winter range. Most of the big game winter range in this unit is located on Forest Service, BLM, and private holdings. Minor portions of the winter range in the unit occur on Utah State School Trust Lands, Division of Wildlife Resources management areas, and Tribal Lands.

According to LANDFIRE Existing Vegetation Coverage models, important shrublands comprise almost 30% of the deer winter range on the unit. The majority of deer winter range is comprised of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands. While these woodlands provide valuable escape and thermal cover for wildlife, encroachment and invasion into historic shrublands reduces available browse and decreases the carrying capacity of the unit. Annual grasslands, primarily cheatgrass (*Bromus tectorum*), comprise a small proportion of the deer winter range and pose a minimal threat for wildfire. Other coverage types comprise a minimal proportion of the deer winter range.

The northern two-thirds of the unit include the high elevation Fish Lake Mountains and constitute summer range for deer. Winter range is primarily confined to the lower elevations of the southern third of the unit and the sagebrush benches on the west side above Highway 24. Antelope are present and are normally found in the more open areas of the deer winter range. Excessive accumulations of snow during severe winters confine deer below the 8,600-foot contour. Pinyon-juniper on both normal and severe wintering areas provides extremely important protective cover for deer, while the closely associated sagebrush type produces the bulk of the required forage.

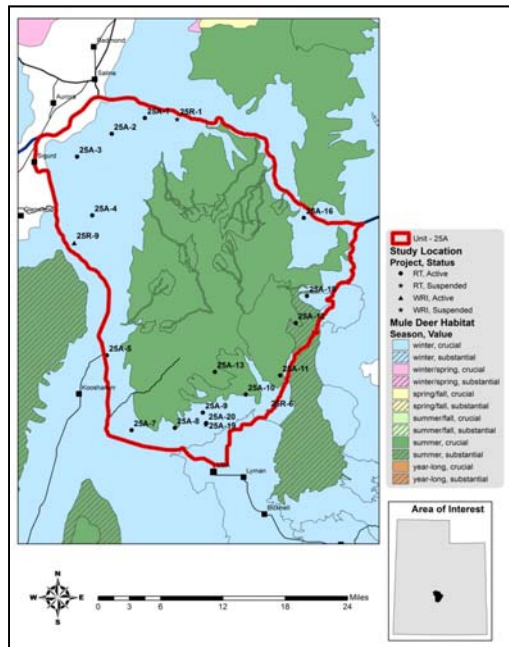
Limiting Factors to Big Game Habitat

A history of heavy overgrazing by sheep and cattle is largely responsible for the present composition of most of the vegetative communities. Although overgrazing may still occur in some areas, grazing restrictions and management plans have been implemented on both Forest Service and BLM lands. Range conditions appear to be improving in most areas. Browse species increased as the competition from grasses and forbs was reduced by the heavy grazing. The result was large areas of deer winter range with abundant browse forage. However, good spring-fall deer range or transition range is lacking. During these seasons, deer seek succulent green grasses and forbs. Because the herbaceous component is inadequate, depredation occurs on private croplands, especially alfalfa fields. The UDWR is working with the other agencies to improve spring-fall ranges with chaining, spraying, harrowing, and/or seeding projects. Additionally gas and oil exploration and road building are current land management concerns. There is presently a moderately high density of roads in the area. Although off-road use of vehicles is prohibited, OHV's and four-wheel drive vehicles have access throughout the unit.

Wildfire has had minimal impact on the deer winter range in the unit. The majority of the fires in this unit have occurred on or near Moroni Peak. The 2003 Moroni Peak fire was the largest wildfire in the unit at 2,545 acres. It

burned in three separate parts with the largest portion being on Moroni Peak. There have been two other fires on the unit greater than 1,000 acres. The Johnson fire burned 1,845 acres in 2002 on Mt. Marvine and a second Moroni Peak fire burned 1,526 acres in 2004. The majority of the other fires in this unit burned 300-600 acres at a time, having a negligible impact on deer winter range.

Encroachment by pinyon-juniper woodland communities also poses a substantial threat to important sagebrush rangelands. Pinyon-juniper woodlands dominate the vegetation coverage within the deer winter range on WMU 25A. Encroachment and invasion of these woodlands into sagebrush communities has been shown to decrease the sagebrush and herbaceous components, and therefore decreases available forage for wildlife (Miller, Svejcar, & Rose, 2000)



Map1: Estimated mule deer habitat by season and value for WMU 25A, Fishlake



Map2: Land ownership for WMU 25A, Fishlake

	Summer Range		Winter Range	
	Area (acres)	%	Area (Acres)	%
Mule Deer	241,169	56%	189,664	44%
Elk	187,480	44%	238,265	56%

Table.1: Estimated mule deer and elk habitat acreage by season for WMU 25A, Fishlake.

Ownership	Summer Range		Winter Range	
	Area (acres)	%	Area (Acres)	%
USFS	199,169	83%	88,754	47%
BLM	5,507	2%	53,156	28%
SITLA	279	<1%	14,950	8%
Tribal Land	0	0%	51	<1%
Private	36,297	15%	32,657	17%
UDOT	0	0%	43	<1%
UDWR	0	0%	52	<1%
Total	241,169	100%	189,664	100%

Table.2: Estimated mule deer habitat acreage by season and ownership for WMU 25A, Fishlake.

Deer Winter Range Condition Assessment

The condition of deer winter range within the Fishlake management unit has generally improved on the study sites sampled since 1998. As of 2013, the majority of the undisturbed sites sampled within the unit are considered to be in good condition with the exception of the Sage Flat site, which has remained in very poor to poor condition on all sample years. This is due to the high amount of annual grass present on this site. The treated study sites are more variable with most sites being fair to good. There are two studies, Triangle Mountain and Black Mountain, which were in very poor condition pre-treatment and have remained that way as time since treatment has increased. Poor deer winter range conditions on these sites are likely due to very low browse cover. Because of a reduction in browse cover, Praetor Slope went from being good at pre-treatment to fair at post treatment. Evans Reservoir, Lower Dog Flat, and Row of Pines Exclosure have improved since treatment.

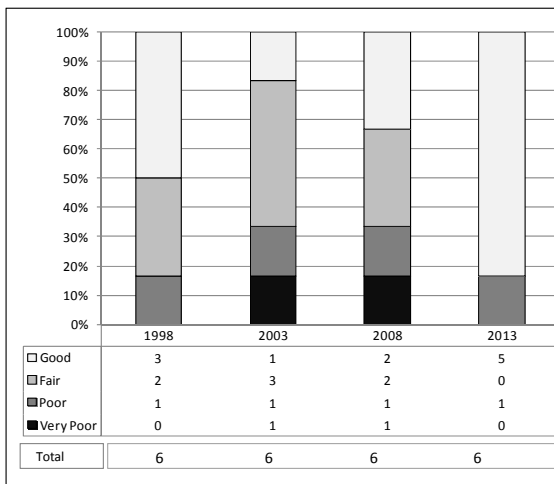


Figure.2: Deer winter range Desirable Components Index (DCI) summary by year of undisturbed sites for WMU 25A Fishlake.

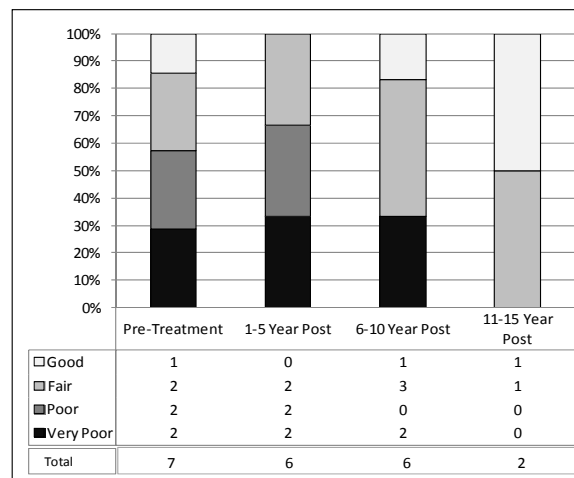
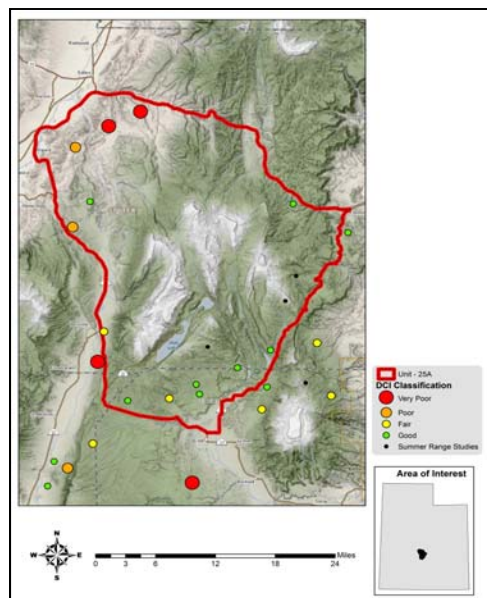


Figure.3: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 25A, Fishlake.



Map.3: Deer winter range Desirable Components Index (DCI) ranking distribution by study site of most current sample date as of 2013 for WMU 25A, Fishlake.

Deer Herd Unit # 25B (Plateau Thousand Lake)

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts such as oil, gas, and coal mining that occurs within the unit.
- Encourage vegetation manipulation projects in PJ communities, with reseeding opportunities to increase the availability, abundance and nutritional content of browse, grass, and forb species.
- Seek cooperative projects and programs to encourage and improve the quality and quantity of deer habitat, with public and private land managers to maintain a stable or upward trend in vegetative composition.
- Provide improved habitat security and escapement opportunities for mule deer keeping habitat restoration projects a priority for wildlife, improvement of sagebrush communities is important on this unit.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

Habitat Protection, Improvement and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies along with private landowners in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.

- Manage vehicle access to limit human disturbance during times of high stress, such as winter and fawning, also work in conjunction with other land management agencies to help limit travel of off road vehicles during these critical times.
- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reducing fuel loads, reseeding burned areas, creating fuel breaks and vegetated green strips.
- Reseed mechanical treatment areas with selected seed species with desirable perennial vegetation focusing on seeding native grass species. Unit is lacking in understory of herbaceous understory specifically forbs.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog treatments and chaining projects.
- Cooperate with federal land management agencies and local governments in developing and administering quality habitat restoration projects tied to management plans for the purposes of habitat protection, and livestock grazing.
- Future habitat work should be concentrated on the following management priorities:
 - Increase browse species in critical winter range areas, continue to seed a quality of grasses, forbs and shrubs in critical burned areas.
 - Improve the need for future carrying capacity of mule deer within the unit.
 - Increase critical winter range opportunities for mule deer by reducing PJ encroachment in mountain and upland communities.
 - Maintain summer fawning areas by increasing beneficial habitat work in summer and transitional habitat areas.
 - Continue to monitor and collect data from browse transects and permanent range trend studies located throughout the seasonal ranges within the unit.
 - Continue to reduce threats to catastrophic wildfires, by reducing fuel loads and creating firebreaks.
 - When selecting and implementing habitat restoration projects, design and develop with wildlife benefit, including grass, forbs and shrubs for mule deer within the seed mixes.
 - Support enhancement and restoration efforts in Quaking Aspen forests within the unit by reducing encroachment of Spruce-Fir forests.
 - Continue to use the Watershed Restoration Initiative (WRI) to identify, implement, and fund critical habitat projects throughout the unit, while partnering with federal, state, and private landowners to achieve these goals.

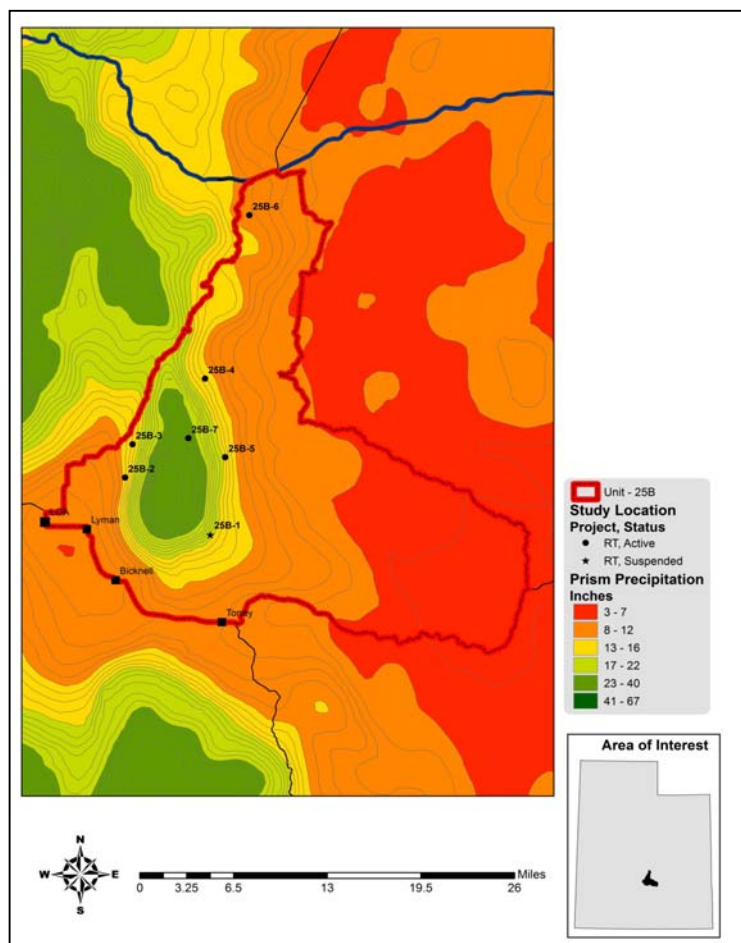
Completed Habitat Projects 2006-2014	# Projects Completed	Acres
Anchor Chain, Seed	1	782
PJ Removal, Seed	1	3,569
Seeding	1	2,345
TOTAL	3	6,696

- Spreadsheet only accounts for completed projects within the WRI Database, current projects are being implemented, along with recommended proposals for future restoration projects within the unit.

Community Types

The 30 year (1981-2010) annual precipitation PRISM model shows precipitation ranges on the unit from 3 inches on the lower east side of the unit to 29 inches on Thousand Lake Mountain. All of the Range Trend and WRI monitoring studies on the unit occur within 12-24 inches of precipitation. (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4). The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2013. The mean annual PDSI displayed years of moderate to extreme wet years from 1982-1985, 1997-1998, 2005, and 2011. The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2002-2004, and displayed years of extreme wet years in 1995, 1999, 2001, 2003, 2007, 2009 and displayed years of extreme wet years in 1998, 2008 and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2012; and moderate to 1982-1985, 1993, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI moderate to 1989-1990, 2002-2012; and moderate to 1982-1985, 1997- (Time Series Data,



Map 4: The 1981-2010 PRISM Precipitation Model for WMU 25B, Thousand Lake (PRISM Climate Group, Oregon State University, 2013)

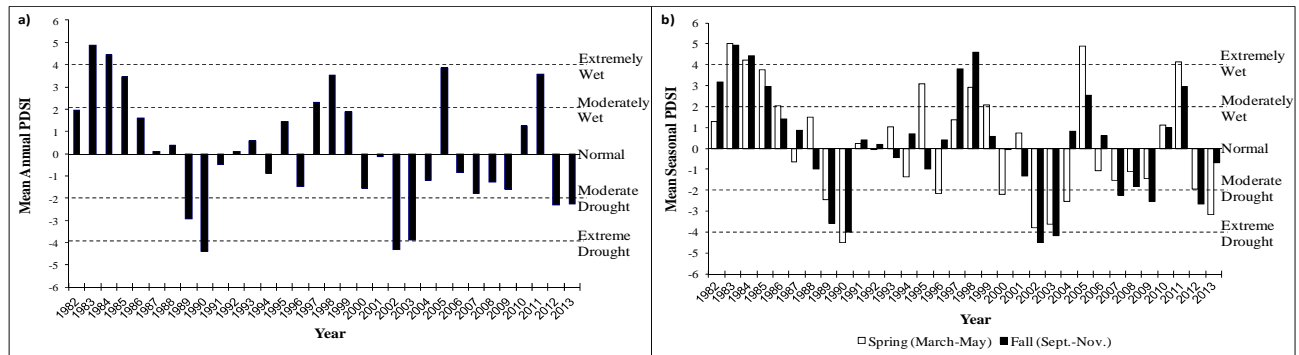


Figure 4: The 1892-2014 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2013. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought (Time Series Data 2014). a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2014).

Big Game Habitat

Total mule deer range in the wildlife management unit is estimated at 314,652 acres with 39,301 acres classified as summer range and 275,351 acres classified as winter range. Total elk range is estimated at 172,845 acres with 28,629 acres of this being classified as summer range and 144,217 as winter range. There is a substantial amount of winter range for deer and elk, however, summer range is limiting for both species. Most of the big game winter range in this unit is located on Forest Service or BLM managed lands. Minor portions of the winter range in the unit occur on private holdings, Utah State School Trust Lands, and National Park Service lands.

According to LANDFIRE Existing Vegetation Coverage models, important shrublands comprise around 32% of the deer winter range on the unit. Another 32% of deer winter range is conifer of which, 24% is comprised of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands. While these woodlands provide valuable escape and thermal cover for wildlife, encroachment and invasion into historic shrublands reduces available browse and decreases the carrying capacity of the unit. Annual grasslands, primarily cheatgrass (*Bromus tectorum*), comprise a very small proportion of the deer winter range and pose a minimal threat for wildfire. Other coverage types comprise an equal proportion of the deer winter range.

The unit has good winter range with ample protective cover, large basins, draws, and open ridges. The upper limits of the normal winter range vary from 8,400 feet at the northern boundary to 9,000 feet on the south end of the Thousand Lake Mountain. The lower normal winter range limit is between 6,000 and 7,400 feet in elevation. At present, the winter range appears ample to support the deer and elk from the Thousand Lakes unit and many wintering deer from the adjacent Fish Lake unit. Solomon Basin, Sage Flat, Horse Valley, Sand Flat, Paradise Flat, and Lyman Slopes are all winter concentration areas.

The condition of the spring and summer range is a current management concern. As the snow begins to recede in the spring, deer seek green grasses and forbs, which are very scarce on the overgrazed spring ranges. At this time, the early green-up in the alfalfa and grain fields on private land near Loa, Fremont, Lyman and Torrey are very attractive to wildlife and depredation becomes a problem.

Limiting Factors to Big Game Habitat

Grazing, uranium exploration, and logging are the three uses that have had the most impact on the Thousand Lakes unit. Grazing of cattle, horses, and sheep commenced with the settlement of the region in the 1860's. The range was open to anyone and was used from the time the snow melted enough in the spring to get livestock on the mountain, until the snow drove them off in the fall. Much of the east side, especially the Solomon Basin area, was used year-round by cattle. Because of the plentiful, well-dispersed water sources, the relatively flat mountaintop was also

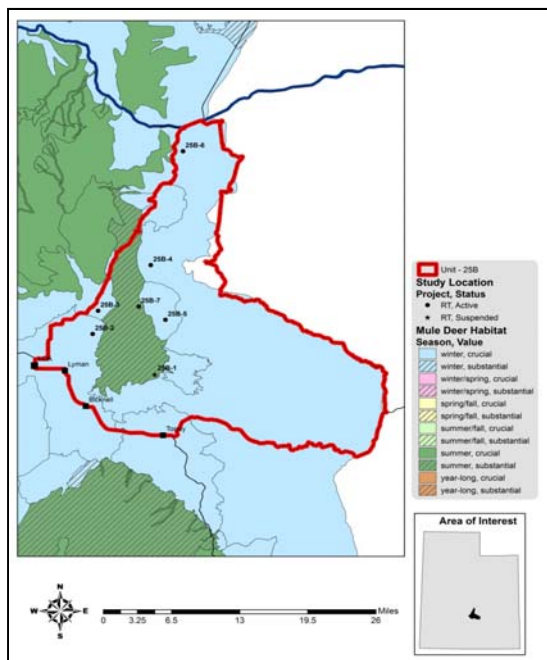
heavily grazed each summer. This overgrazing resulted in soil compaction and loss at water sources, erosion problems, decreased water quality, and a decrease of the herbaceous component of the vegetative community, until a nearly monotypic shrub type remained. The Forest Service has gradually increased grazing restrictions in order to allow the range to recover. Currently many areas are beginning to show improvements, but it will take a long time for the land to recover naturally.

Uranium prospectors have left their mark on the land. Four-wheel drive vehicles and heavy equipment tracks are present on the unit and are still visible. Gas and oil exploration is an ongoing activity and coal deposits in the Last Chance area have drawn proposals for both underground and strip mining. SR-72, which forms the western boundary of the unit, is maintained for year-round use. This will tend to encourage more recreation and tourism through the area and may increase highway collisions with wildlife.

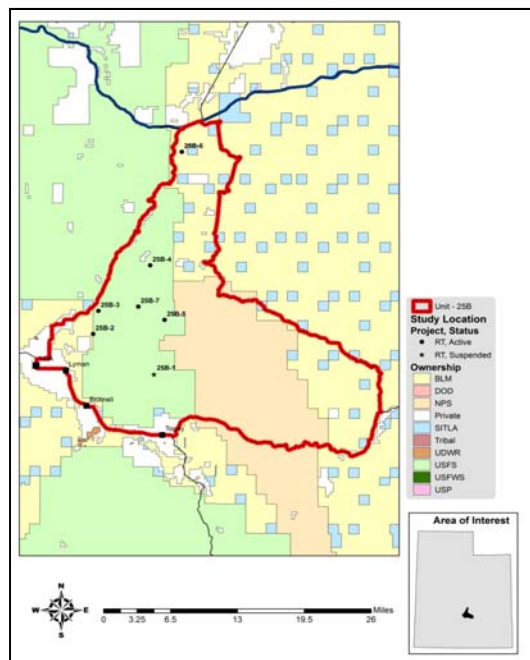
Stands of ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), and Engelmann spruce (*Picea engelmannii*) are found on the mountain with many areas having been logged in the past. Fire suppression has contributed to the accelerated succession of the high mountain aspen-meadows to climax stands of Engelmann spruce. Canopy closure in these spruce forests nearly eliminates all understory species, resulting in a significant loss of forage production.

Wildfire has had a minimal impact on the deer winter range in the unit. The Solomon Basin fire of 2009 was the only wildfire in the unit at 1,619 acres. It burned an area north of Flat Top peak near Solomon Basin. There have been no other recent fires on deer winter range.

Encroachment by pinyon-juniper woodland communities also poses a threat to important sagebrush rangelands. Pinyon-juniper woodlands constitute a fair amount of the vegetation coverage within the deer winter range on WMU 25B. Encroachment and invasion of these woodlands into sagebrush communities has been shown to decrease the sagebrush and herbaceous components, and therefore decreases available forage for wildlife (Miller, Svejcar, & Rose, 2000).



Map5: Estimated mule deer habitat by season and value for WMU 25B, Thousand Lake.



Map6: Land ownership for WMU 25B, Thousand Lake.

	Summer Range		Winter Range	
	Area (acres)	%	Area (Acres)	%
Mule Deer	39,301	12%	275,351	88%
Elk	28,629	17%	144,217	83%

Table.3: Estimated mule deer and elk habitat acreage by season for WMU 25B, Thousand Lake.

Ownership	Summer Range		Winter Range	
	Area (acres)	%	Area (Acres)	%
USFS	38,955	99%	65,673	24%
BLM	0	0%	82,550	30%
SITLA	0	0%	9,557	4%
Private	45	<1%	14,963	5%
NPS	301	<1%	102,609	37%
Total	39,301	100%	275,351	100%

Table.4: Estimated mule deer habitat acreage by season and ownership for WMU 25B, Thousand Lake.

Deer Winter Range Condition Assessment

The condition of deer winter range within the Thousand Lake management unit has generally improved on the study sites sampled since 1994. The majority of the undisturbed sites sampled within the unit are considered to be in good to fair condition, with the exception of 2009 when sites were considered fair to poor. The mid potential sites Solomon Basin and Polk Creek are the sites that are in fair to poor condition. The treated study site transitioned from poor pre-treatment to fair post treatment. At the last reading there were no study sites that were in poor or very poor condition.

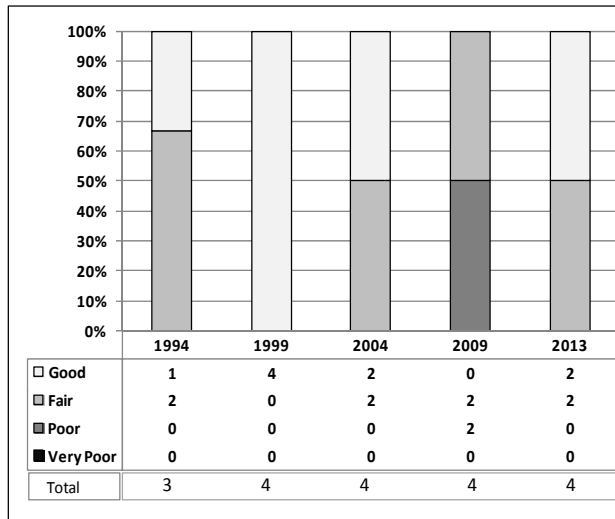


Figure 5: Deer winter range Desirable Components Index (DCI) summary by year of undisturbed sites for WMU 25B Thousand Lake.

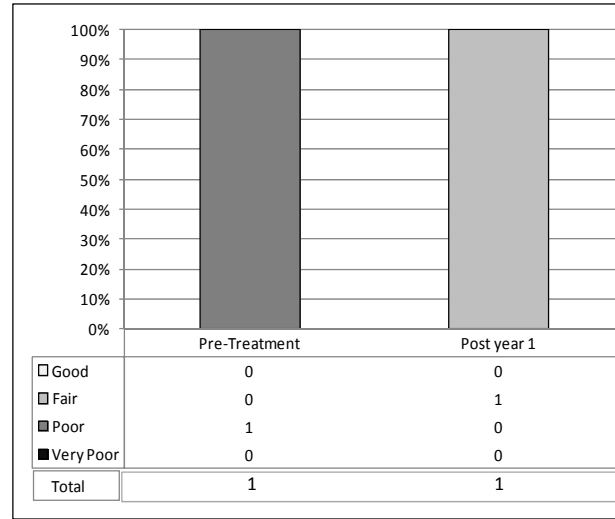
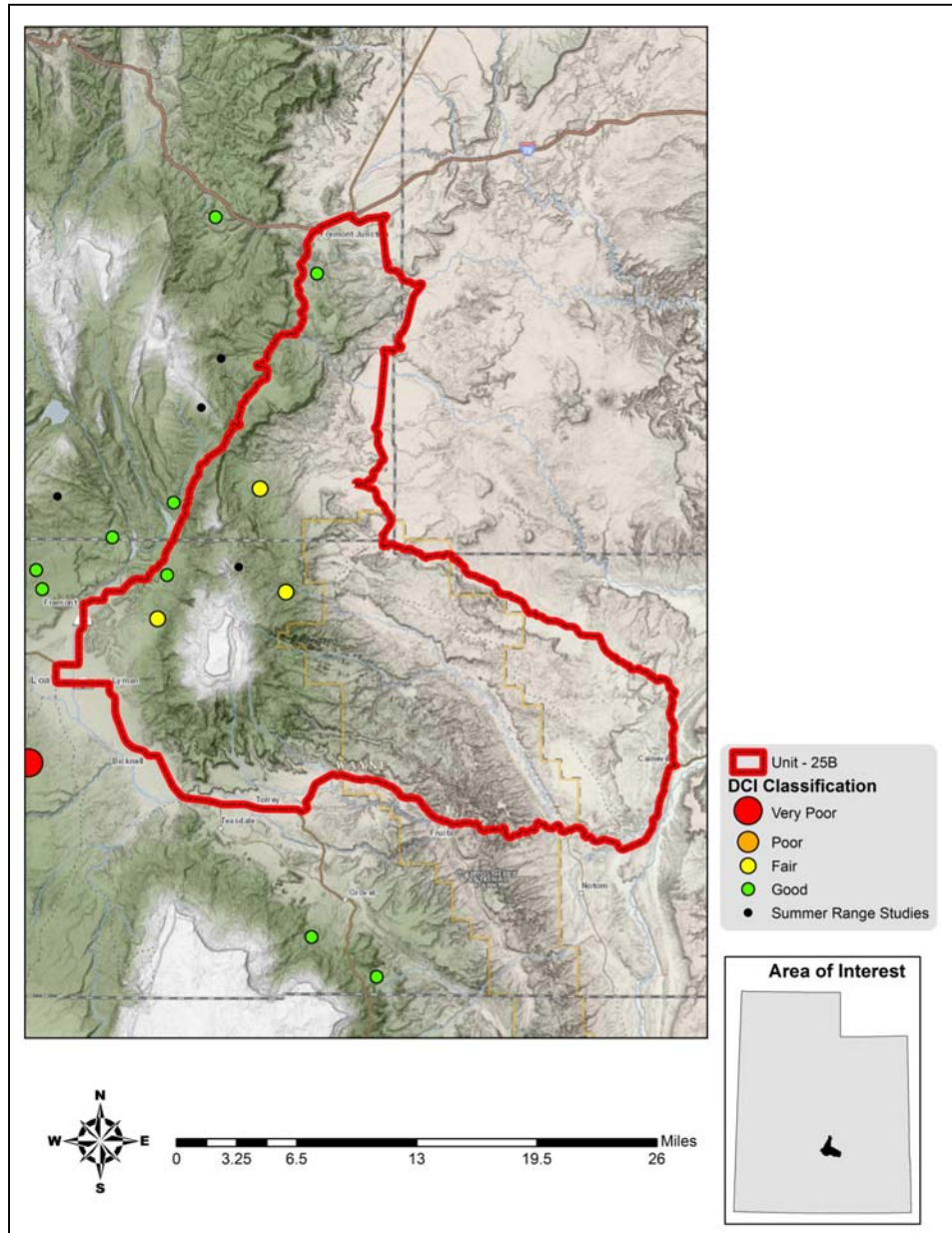


Figure 6: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 25B, Thousand Lake.



Map.7: Deer winter range Desirable Components Index (DCI) ranking distribution by study site of most current sample date as of 2013 for WMU 25B, Thousand Lake.

**Deer Herd Unit # 25C/26
(Plateau Boulder/Kaiparowits)**

HABITAT MANAGEMENT OBJECTIVES

- Maintain mule deer habitat throughout the unit by protecting and enhancing existing crucial habitats and mitigating for losses due to natural and human impacts.
- Encourage vegetation manipulation projects and seeding to increase the availability,

abundance and nutritional content of browse, grass, and forb species.

- Seek cooperative projects and programs to encourage and improve the quality and quantity of deer habitat, with public and private land managers to maintain a stable or upward trend in vegetative composition.
- Provide improved habitat security and escapement opportunities for mule deer keeping habitat restoration projects a priority for wildlife.

HABITAT MANAGEMENT STRATEGIES

Monitoring

- Determine trends in habitat condition through permanent range trend studies, spring range assessments; pellet transects, and field inspections. Land management agencies will similarly conduct range monitoring to determine vegetative trends, utilization and possible forage conflicts.
- Range trend studies will be conducted by DWR to evaluate deer habitat health, trend, and carrying capacity using the deer winter range Desirable Component Index (DCI) and other vegetation data. The DCI was created as an indicator of the general health of deer winter ranges. The index incorporates shrub cover, density and age composition as well as other key vegetation variables. Changes in DCI suggest changes in winter range capacity. The relationship between DCI and the changes in deer carrying capacity is difficult to quantify and is not known.

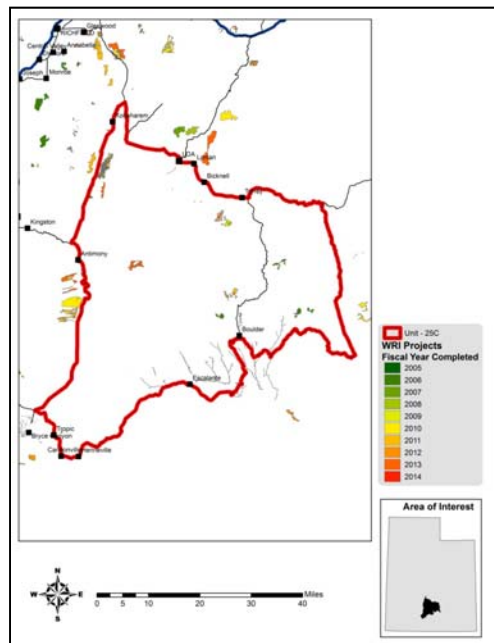
Habitat Protection, Improvement and Maintenance

- Work with public land management agencies to develop specific vegetative objectives to maintain the quality of important deer use areas.
- Continue to coordinate with land management agencies in planning and evaluating resource uses and developments that could impact habitat quality including but not limited to: oil and gas development, wind energy, solar energy, and transmission line construction.
- Work toward long-term habitat protection and preservation through the use of agreements with land management agencies and local governments, and through the use of conservation easements, etc. on private lands.
- Continue to cooperate with Utah Department of Transportation (UDOT) and or Sportsman's groups to identify areas to mitigate and prevent deer-vehicle collisions to the extent possible.
- Cooperate with federal land management agencies and private landowners in carrying out habitat improvement projects. Protect deer winter ranges from wildfire by reseeding burned areas, creating fuel breaks and vegetated green strips.
- Reseed mechanical treatment areas with selected seed species that will out compete areas dominated by cheatgrass with desirable perennial vegetation focusing on seeding native grass species.
- Reduce expansion of Pinyon-Juniper woodlands into sagebrush habitats and improve habitats dominated by Pinyon-Juniper woodlands by completing habitat restoration projects like lop & scatter, bullhog and chaining projects.
- Cooperate with federal land management agencies and local governments in developing and

administering access management plans for the purposes of habitat protection and escape or security areas.

- Future habitat work should be concentrated on the following management priorities:
 - Increase browse species in critical winter range, and burned areas.
 - Increase critical winter range opportunities for mule deer.
 - Maintain summer fawning areas by increasing beneficial habitat work in summer and transitional habitat areas.
 - Continue to monitor and collect data from browse transects and permanent range trend studies located throughout the seasonal ranges within the unit.
 - Continue to reduce threats to catastrophic wildfires, by reducing fuel loads and creating firebreaks.
 - When selecting and implementing habitat restoration projects, design and develop with wildlife benefit, including grass, forbs and shrubs for mule deer within the seed mixes.
 - Support enhancement and restoration efforts in Quaking Aspen forests unit wide by reducing encroachment of Spruce-Fir forests.
 - Continue to use the Watershed Restoration Initiative (WRI) to identify, implement, and fund critical habitat projects throughout the unit, while partnering with federal, state, and private landowners to achieve these goals.

Treatments/Restoration Work



Map 1: WRI treatments by Fiscal Year

Treatment Action	Acres
Brush beater (mower)	16
Bullhog	237
Harrow	4,753
Mower	804
Prescribed fire	1,900
Seeding (primary)	6,404
Lop and scatter	2,374
*Total Acres Treated	16,488
Total Treatment Acres	12,503

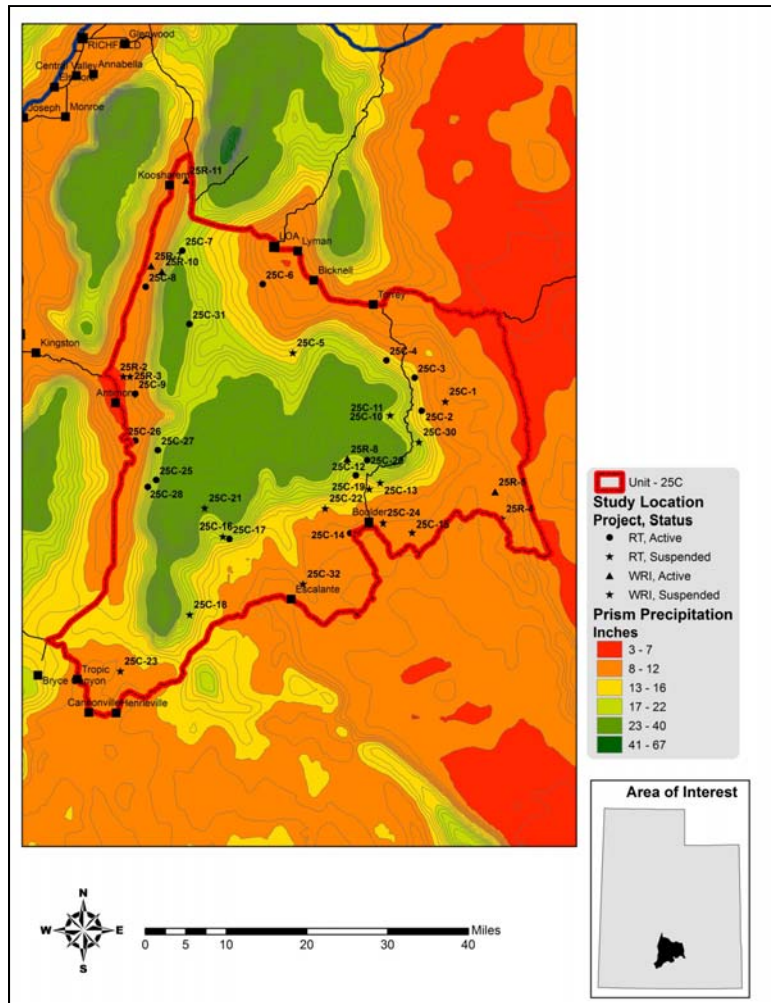
Table 1: WRI treatment size (acres).
 *Majority of seeding was done in conjunction with wildfire restoration efforts.
 **Does not include overlapping treatments

Climate Data

The 30-year (1981-2010) annual precipitation PRISM model shows precipitation ranges between 5 to 7 inches at Capitol Reef, 10 to 12 inches at Boulder and Escalante on the southern border, and 25 to 30 inches on Boulder Mountain. All of the Range Trend and WRI monitoring studies on the unit occur between 7-24 inch precipitations zones (Map) (PRISM Climate Group, Oregon State University, 2013).

Vegetation trends are dependent upon annual and seasonal precipitation patterns. Palmer Drought

Severity Index (PDSI) data for the unit were compiled from the National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Division (PSD) as part of the South Central division (Division 4). The mean annual PDSI of the South Central division displayed years of moderate to extreme drought from 1989-1990, 2002-2003, and 2012-2013. The mean annual PDSI displayed years of moderate to extreme wet years from 1982-1985, 1997-1998, 2005, and 2011. The mean spring (March-May) PDSI displayed years of moderate to extreme drought in 1989-1990, 1996, 2002-2004, and 2013; and displayed years of moderate to extreme wet years in 1982-1985, 1993, 1995, 1999, 2001, 2005, and 2011. The mean fall (Sept.-Nov.) PDSI displayed years of moderate to extreme drought in 1989-1990, 2002-2003, 2007, 2009 and 2012; and displayed years of moderate to extreme wet years in 1982-1985, 1997-1998, 2008 and 2011. (Time Series Data, 2014).



Map 2: The 1981-2010 PRISM Precipitation Model for WMU 25C, Boulder (PRISM Climate Group, Oregon State University, 2013)

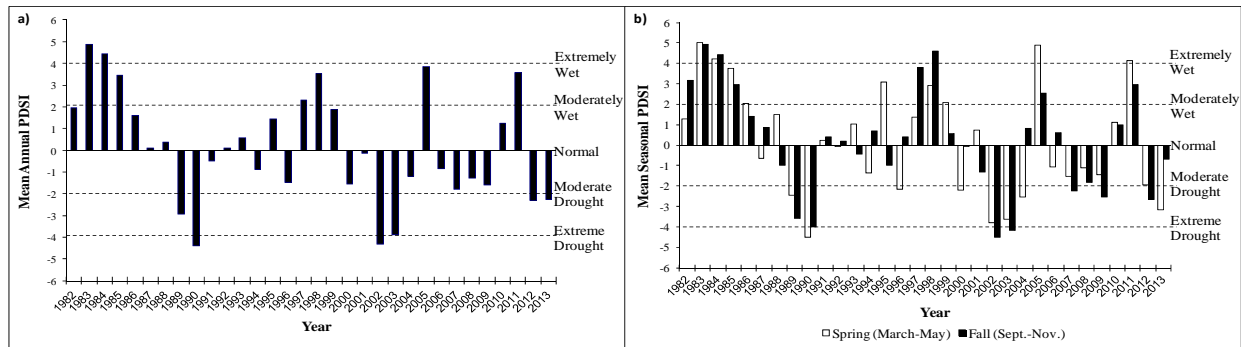


Figure 7: The 1982-2014 Palmer Drought Severity Index (PDSI) for the South Central division (Division 4). The PDSI is based on climate data gathered from 1895 to 2013. The PDSI uses a scale where 0 indicates normal, positive deviations indicate wet and negative deviations indicate drought. Classification of the scale is ≥ 4.0 = Extremely Wet, 3.0 to 3.9 = Very Wet, 2.0 to 2.9 = Moderately Wet, 1.0 to 1.9 = Slightly Wet, 0.5 to 0.9 = Incipient Wet Spell, 0.4 to -0.4 = Normal, -0.5 to -0.9 = Incipient Dry Spell, -1.0 to -1.9 = Mild Drought, -2.0 to -2.9 = Moderate Drought, -3.0 to -3.9 = Severe Drought and ≤ -4.0 = Extreme Drought (Time Series Data 2014). a) Mean annual PDSI. b) Mean spring (March-May) and fall (Sept.-Nov.) (Time Series Data, 2014).

Big Game Habitat

Total mule deer range in the wildlife management unit is estimated at 2,109,053 acres with 42,311 being classified as year-long range, 1,432,127 acres classified as winter range, and 634,615 acres classified as summer range. Most of the big game winter range in this unit is located on Forest Service or BLM managed lands. Minor portions of the winter range in the unit occur on private holdings, Utah State School Trust Lands, and Division of Wildlife Resources management areas.

According to LANDFIRE Existing Vegetation Coverage models, important shrublands comprise less than 30% of the deer winter range on the unit. The majority of deer winter range is comprised of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*) woodlands. While these woodlands provide valuable escape and thermal cover for wildlife, encroachment and invasion into historic shrublands reduces available browse and decreases the carrying capacity of the unit. Annual grasslands, primarily cheatgrass (*Bromus tectorum*), is not a major land type contributor within deer winter range and poses little threat for wildfire. Other cover types comprise a minimal proportion of the deer winter range.

The winter range is large enough to support all of the deer summering on the unit. With a few localized exceptions, it is in mostly good condition. Huff & Coles (1966) drew the upper limits of the winter range between 8,000 and 8,400 feet and the lower limits between 6,500 and 7,000 feet. The pinyon-juniper and sagebrush types with various combinations of the two, dominate the winter range. South of Boulder Mountain, there is abundant winter range. However, much of the country is slickrock canyons and mesas that support few deer. Most wintering takes place on the lower slopes and at the base of the mountain. The upper limits of the normal winter range are uniform at 8,000 feet across the south slopes of the Boulder Mountain. Seven thousand feet is the usual upper limit during severe winter conditions. The lower limit for most wintering deer on the south side of the unit is Highway 12. On the west, side of the Aquarius Plateau between Antimony and Widtsoe winter range is more restricted. The mountain drops off steeply from Griffin Top to the river valley. Deer can typically utilize vegetation up to 9,000 feet during normal winters, but are limited to an upper limit of around 8,000 feet during severe winters. The lower boundary for severe winters is the bottom of the valley on the Sevier River, which is approximately 6,500 feet.

Summer range is limited to specific areas on Parker Mountain and Boulder Mountain. Boulder Mountain contains approximately 50,000 acres above 10,500 feet (Christensen & Bogedahl, 1983). This high summer range is unsuitable for fawning and receives only light deer use in late summer. Most fawning and summer use is concentrated underneath the lava rock rim where stands of aspen, fir, and spruce are interspersed with sage flats and meadows. Because of fire suppression, the trend is toward a more dense spruce climax community. Logging and/or prescribed burns may help maintain this important habitat in a seral stage, which is more productive and more favorable to big game. Lower down the

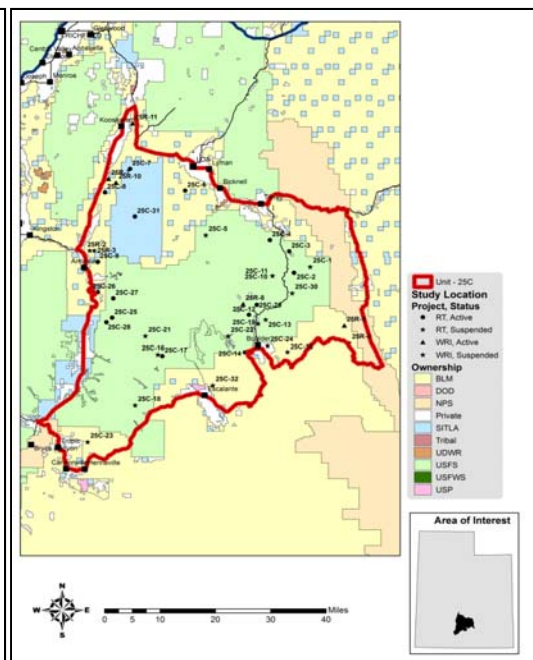
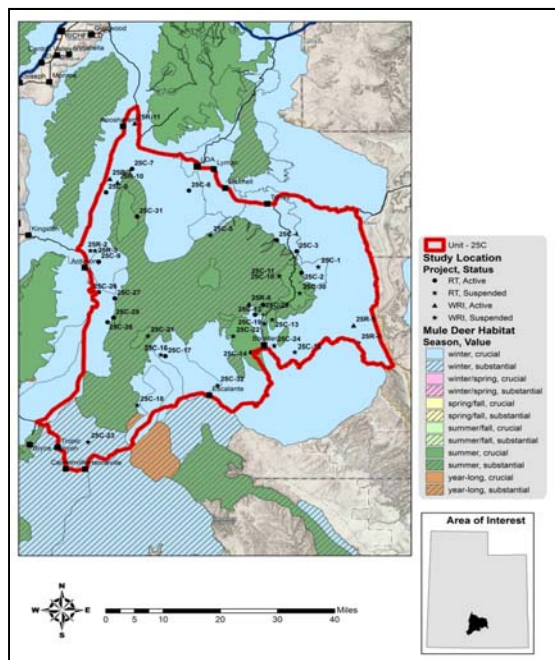
slopes, ponderosa pine with its associated mountain brush understory receives limited summer use. Summer range on Parker Mountain is more limited to the higher southern end, where aspen stands in association with big sagebrush and antelope bitterbrush provide excellent fawning areas.

Limiting Factors to Big Game Habitat

The Boulder Plateau and the surrounding winter range have a wide variety of multiple uses that stem from a diverse range of landownership and land management principles. Private land practices mainly include ranching and alfalfa production, while state and federal land uses include livestock grazing, mineral and resource exploration and extraction, road building, OHV riding, camping, and wilderness designations. Many of the land uses within the unit can be harmonious with the management of big game habitat while other land practices may negatively affect its management within the unit. There is ample range for deer in normal winters. Only in severe winters when the usable range may become limited. Additionally, the potential to increase forage for wintering deer and elk is substantial and can be gained by the removal of encroached pinyon and juniper trees that are very pronounced along benches and flats of the Boulder Plateau.

Wildfire has not made a substantial impact on the deer winter range in the unit. Additionally, few of the range trend studies have captured wildfire events, which means any response by rehabilitation efforts or recovery of sagebrush communities within the fire perimeters since the year 2000 have not been evaluated.

Encroachment by pinyon-juniper woodland communities also poses a substantial threat to important sagebrush rangelands. Pinyon-juniper woodlands dominate the vegetation coverage within the deer winter range on WMU 25C. Encroachment and invasion of these woodlands into sagebrush communities has been shown to decrease the sagebrush and herbaceous components, and therefore decreases available forage for wildlife (Miller, Svejcar, & Rose, 2000).



Map 3: Estimated mule deer habitat by season and value for WMU 25C, Boulder

Map 4: Land ownership for WMU 25C, Boulder

	Year-Long Range		Summer Range		Winter Range	
Species	Area (acres)	%	Area (acres)	%	Area (Acres)	%
Mule Deer	42,311	2%	634,615	30%	1,432,127	67%

Table 2: Estimated mule deer habitat acreage by season for WMU 25C, Boulder

	Year-Long Range		Summer Range		Winter Range	
Ownership	Area (acres)	%	Area (acres)	%	Area (Acres)	%
USFS	21,534	51%	429,081	68%	232,815	16%
BLM	18,453	44%	143,227	23%	906,177	63%
NPS	0	0%	6,451	1%	102,656	7%
SITLA	639	2%	52,905	8%	87,707	6%
Private	1685	4%	2,951	<1%	132,368	5%
UDOT	0	0%	0	0%	3	<1%
USP	0	0%	0	0%	4,539	<1%
UDWR	0	0%	0	0%	1,101	<1%
Total	42,311	100%	634,615	100%	1,432,127	100%

Table 3: Estimated mule deer habitat acreage by season and ownership for WMU 25C, Boulder

Deer Winter Range Condition Assessment

The condition of deer winter range within the Boulder management unit has improved slightly in quality as a whole since 1998. The majority of sites sampled within the unit are considered to be in fair to good condition based on the most current sample data, and the proportion of sites classified as being in poor or very poor condition has varied since 1998, but the poor condition class has transitioned to good since the last evaluation. The only undisturbed study that has consistently and is currently considered to be in very poor condition is the Terza Flat study which has a depleted browse component and lacks a quality herbaceous component that is dominated by the weedy annual forb halogeton. The condition of disturbed and treated sites typically improves with increased time after disturbance on this unit. The disturbed or treated study sites ranked as being in poor or very poor condition are absent in post year 11-15. The North Creek study site was ranked as being in poor condition at 6-10 post years due to a depleted browse and herbaceous components. Cheatgrass has also been present on the North Creek study since the fire disturbance. The very poor condition class is only observed within the pre-treatment and post year 1-5 sample periods, which is primarily due to the lack of browse and herbaceous components of their respective studies.

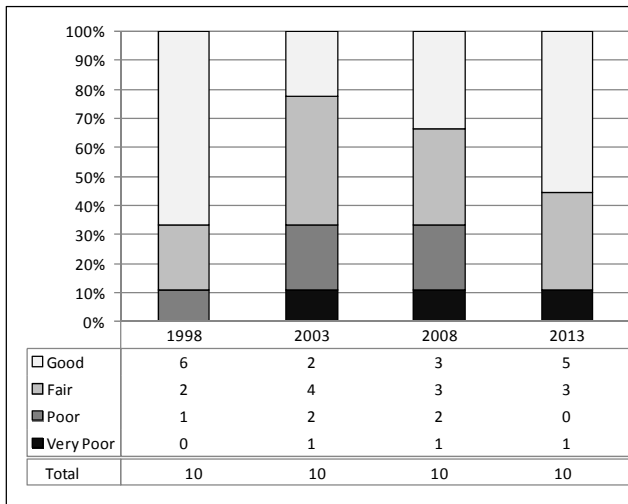


Figure.8: Deer winter range Desirable Components Index (DCI) summary by year of undisturbed sites for WMU 25C Boulder.

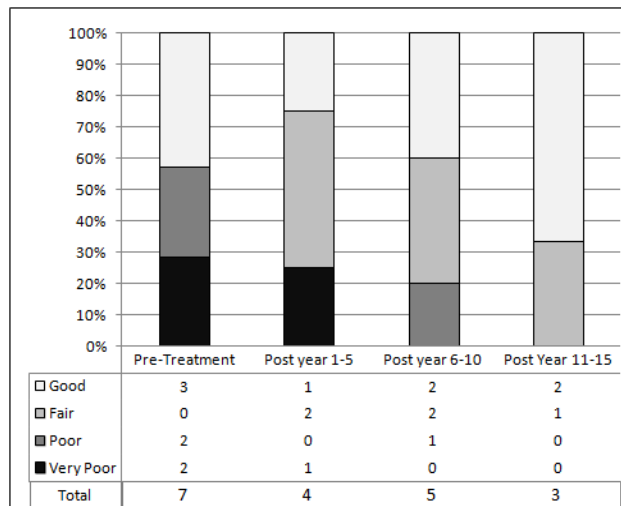
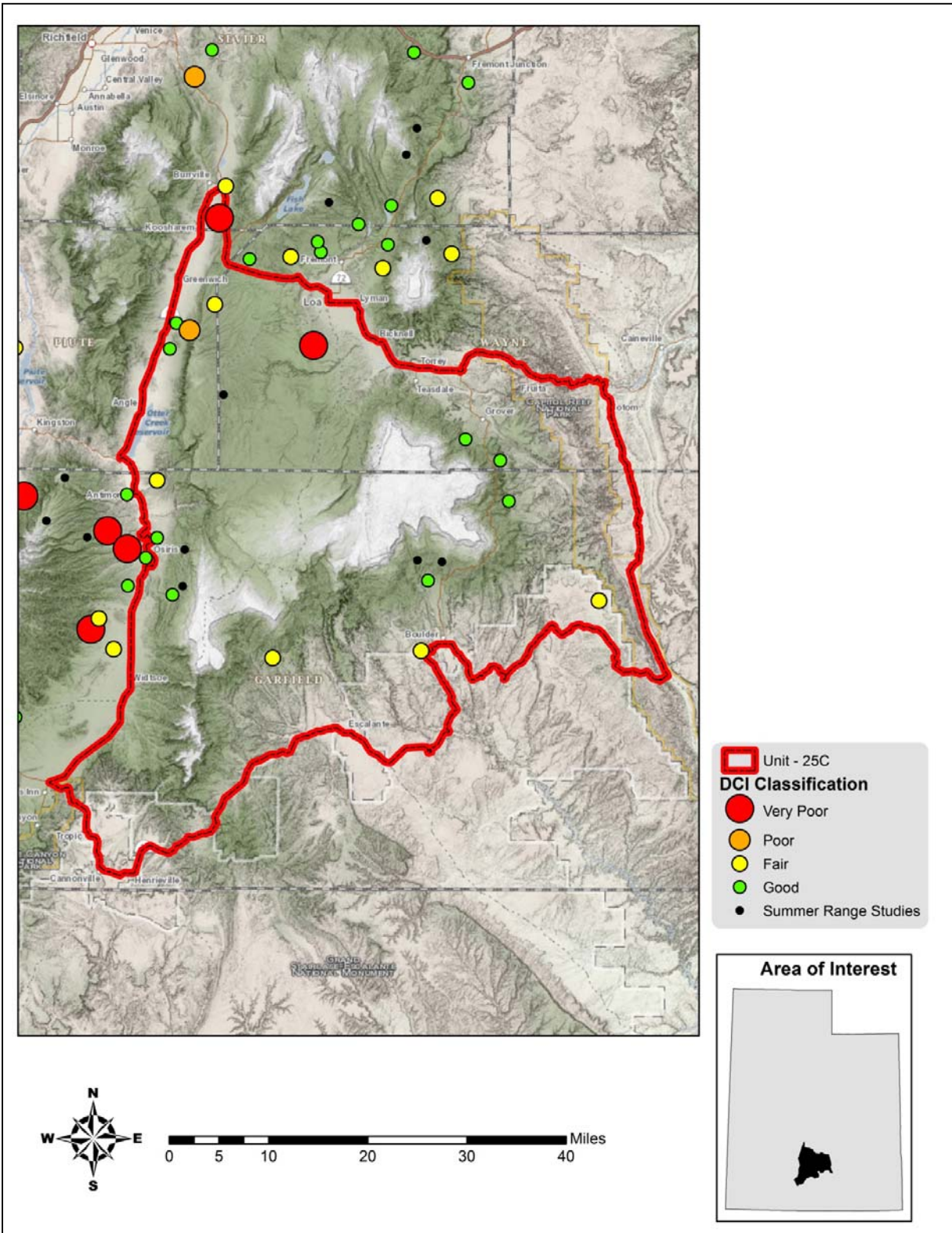


Figure.9: Deer winter range Desirable Components Index (DCI) summary by year of treated/disturbed sites for WMU 25C Boulder.



Map 5: Deer winter range Desirable Components Index (DCI) ranking distribution by study site of most current sample date as of 2013 for WMU 25C Boulder

Duration of Plan

This unit management plan was approved by the Wildlife Board on _____ and will be in effect for five years from that date, or until amended.

APPENDIX

Unit 25a Plateau, Fishlake Subunit

Sevier, Piute, and Wayne counties - Boundary begins at SR-24 and US-89 at Sigurd; south on SR-24 to SR-72 at Loa; north on SR-72 to I-70; west on I-70 to US-89; south on US-89 to SR-24.

Unit 25b Plateau, Thousand Lake Subunit

Sevier, and Wayne counties - Boundary begins at the junction of SR-24 and SR-72 at Loa; southeast on SR-24 to the Cainville Wash road; north on the Cainville Wash road to the junction of I-70 and SR-72; south on SR-72 to SR-24 at Loa.

Unit 25c Plateau, Boulder Subunit

Garfield, Piute, and Wayne counties - Boundary begins at SR-24 and SR-62; south on SR-62 to SR-22; south on SR-22 to the Antimony-Widtsoe road; south on the Antimony-Widtsoe road to SR-12; east on SR-12 to the Burr Trail at Boulder; east on the Burr Trail road to the Notom Road; north on the Notom Road to SR-24; west on SR-24 to SR-62.